CLAIMS

We claim:

1. A catheter device for diagnostic vascular treatment and/or therapeutic vascular treatment of a subject's vasculature, said device comprising:

a catheter shaft having a proximal portion and a distal portion; and

a distal tip disposed on said distal portion, said distal tip having a blunt shape adapted to avoid or mitigate trauma with an ostium of the vasculature.

2. The catheter device of claim 1, wherein said distal tip is adapted to be compressible to fit through a sheath or other conduit.

3. The catheter device of claim 1, wherein said distal tip is inflatable.

4. The catheter device of claim 1, wherein said distal tip has at least one the following shapes: olive, bulbous, rounded, spherical, hemispherical, conical, oval, tapered, beveled, chamfered, graduated and/or multi-faceted, or any combination thereof.

5. The device of claim 4, wherein said distal tip comprises a set-back extension located on the distal end of said distal tip.

6. The device of claim 5, wherein said set-back extension having a blunt shape adapted to avoid or mitigate trauma with an ostium of the vasculature.

7. The catheter device of claim 6, wherein said set-back extension has at least one the following shapes: olive, bulbous, rounded, spherical, hemispherical, conical, oval, tapered, beveled, chamfered, graduated and/or multi-faceted, or any combination thereof.

8. The device of claim 5, wherein said set-back extension has at least one the following shapes: semi-elliptical, semi-spherical, hemispherical, semi-oval, partly rounded or partly olive, or any combination thereof.

9. The device of claim 5, wherein said set-back extension is adapted to be

manipulated along the entire geometric spectrum of potential shapes to create non-traumatic tip.

10. The catheter device of claim 5, further comprising:
a set-back balloon disposed on said set-back extension that is inflatable.

11. The catheter device of claim 10, wherein said set-back balloon has a pre-formed shape for inflation.

12. The device of claim 1, wherein said distal tip comprises a set-back off extension located on the distal end of said distal tip.

13. The device of claim 12, wherein said set-back extension having a blunt shape adapted to avoid or mitigate trauma with an ostium of the vasculature.

14. The catheter device of claim 13, wherein said set-back extension has at least one the following shapes: olive, bulbous, rounded, spherical, hemispherical, conical, oval, tapered, beveled, chamfered, graduated and/or multi-faceted, or any combination thereof.

15. The device of claim 12, wherein said set-back extension has at least one the following shapes: semi-elliptical, semi-spherical, hemispherical, semi-oval, partly rounded or partly olive, or any combination thereof.

16. The device of claim 12, wherein said set-back extension is adapted to be manipulated along the entire geometric spectrum of potential shapes to create non-traumatic tip.

17. The catheter device of claim 12, further comprising:
a set-back balloon disposed on said set-back extension that is inflatable.

18. The catheter device of claim 17, wherein said set-back balloon has a pre-formed shape for inflation.

19. The device of claim 1, wherein said distal tip has at least one the following shapes: semi-elliptical, semi-spherical, hemispherical, semi-oval, partly rounded or partly olive, or any combination thereof.

20. The device of claim 1, wherein said distal tip is adapted to be manipulated along the entire geometric spectrum of potential shapes to create non-traumatic tip.

21. The catheter device of claim 1, further comprising:
a balloon disposed on said distal tip that is inflatable.

22. The catheter device of claim 21, wherein said balloon has at least one the following shapes when at least partially inflated: olive, bulbous, rounded, spherical, hemispherical, conical, oval, tapered, beveled, chamfered, graduated and/or multi-faceted, or any combination thereof.

23. The catheter device of claim 21, wherein said balloon has at least one the following shapes when at least partially inflated: cylindrical, tubular or ring-like.

24. The catheter device of claim 21, wherein said balloon has a pre-formed shape for inflation.

25. The device of claim 21, wherein said distal tip comprises a set-back extension located on the distal end of said distal tip located distally from said balloon.

26. The device of claim 25, wherein said set-back extension having a blunt shape adapted to avoid or mitigate trauma with an ostium of the vasculature.

27. The catheter device of claim 26, wherein said distal tip has at least one the following shapes: olive, bulbous, rounded, spherical, hemispherical, conical, oval, tapered, beveled, chamfered, graduated and/or multi-faceted, or any combination thereof.

28. The device of claim 25, wherein when said balloon is in an inflated state said distal tip forms a non-traumatic shape.

29. The catheter device of claim 1, further comprising:
a plurality of balloons disposed on said distal tip is inflatable.

30. The device of claim 29, wherein said distal tip comprises a set-back extension located on the distal end of said distal tip located distally from at least one of said balloons.

31. The device of claim 30, wherein said set-back extension having a blunt shape adapted to avoid or mitigate trauma with an ostium of the vasculature.

32. The catheter device of claim 31, wherein said set-back extension has at least one the following shapes: olive, bulbous, rounded, spherical, hemispherical, conical, oval, tapered, beveled, chamfered, graduated and/or multi-faceted, or any combination thereof.

33. The device of claim 29, wherein when at least some of said balloons are in an inflated state said distal tip forms a non-traumatic shape.

34. The device of any one of claims 5, 12, 25, or 30, wherein said set-back extension is greater than 10 cm.

35. The device of any one of claims 5, 12, 25, or 30, wherein said set-back extension is less than 10 cm.

36. The device of any one of claims 5, 12, 25, or 30, wherein said set-back extension is about 2 cm.

37. The device of any one of claims 5, 12, 25, or 30, wherein said set-back extension is about 1 cm.

38. The device of any one of claims 5, 12, 25, or 30, wherein said set-back

extension is between about 1 cm and about 5 mm.

39. The device of any one of claims 5, 12, 25, or 30, wherein said set-back extension is less than about 5 mm.

40. The device of any one of claims 5, 12, 25, or 30, wherein said set-back extension is about 1 mm.

41. The device of claim 1, wherein the vascular diagnostic treatment comprises an invasive procedure in which the catheter device and related are passed into a peripheral vein or artery, through the blood vessels, and into the heart or other vasculature.

42. The device of claim 1, wherein the vascular diagnostic treatment comprises at least one of: coronary and peripheral vasculature angiography or coronary arteriography and angiography.

43. The device of claim 1, wherein the vascular therapeutic treatment comprises therapeutic cardiac catheterization including at least one of the following: percutaneous transluminal angioplasty (PTA) (alternatively, percutaneous transluminal coronary angioplasty (PTCA)), percutaneous coronary intervention (PCI), and percutaneous transluminal interventions (PTI).

44. The device of claim 1, wherein the vascular therapeutic treatment provides improved leverage for delivery of therapeutic interventional hardware.

45. The device of claim 44, wherein the hardware comprises at least one of balloons, stents, atherectomy devices, lasers, or thrombectomy devices.

46. The device of claim 1, wherein said catheter shaft comprises a lumen defining an orifice disposed on said distal tip.

47. The device of claim 46, wherein said orifice comprises a perimeter that is

substantially rounded creating a smooth, non-edged orifice interface with the subject's vasculature.

48. The device of claim 1, wherein the blunt shape of said distal tip prevents deep seating of a guide that is being used in said catheter device during treatment while maintaining opposing vascular wall leverage obtained from pre-formed guides.

49. A method of performing diagnostic vascular treatment and/or therapeutic vascular treatment on a subject's vasculature using a catheter device, wherein said catheter device comprises:

a catheter shaft having a proximal portion and a distal portion; and

a distal tip disposed on said distal portion, said distal tip having a blunt shape adapted to avoid or mitigate trauma with an ostium of the vasculature.

50. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to any one of claims 1-33 or 41-48.

51. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 34.

52. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 35.

53. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 36.

54. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 37.

55. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 38.

56. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 39.

57. The method of performing diagnostic vascular treatment and/or therapeutic vascular treatment using a catheter device according to claim 40.